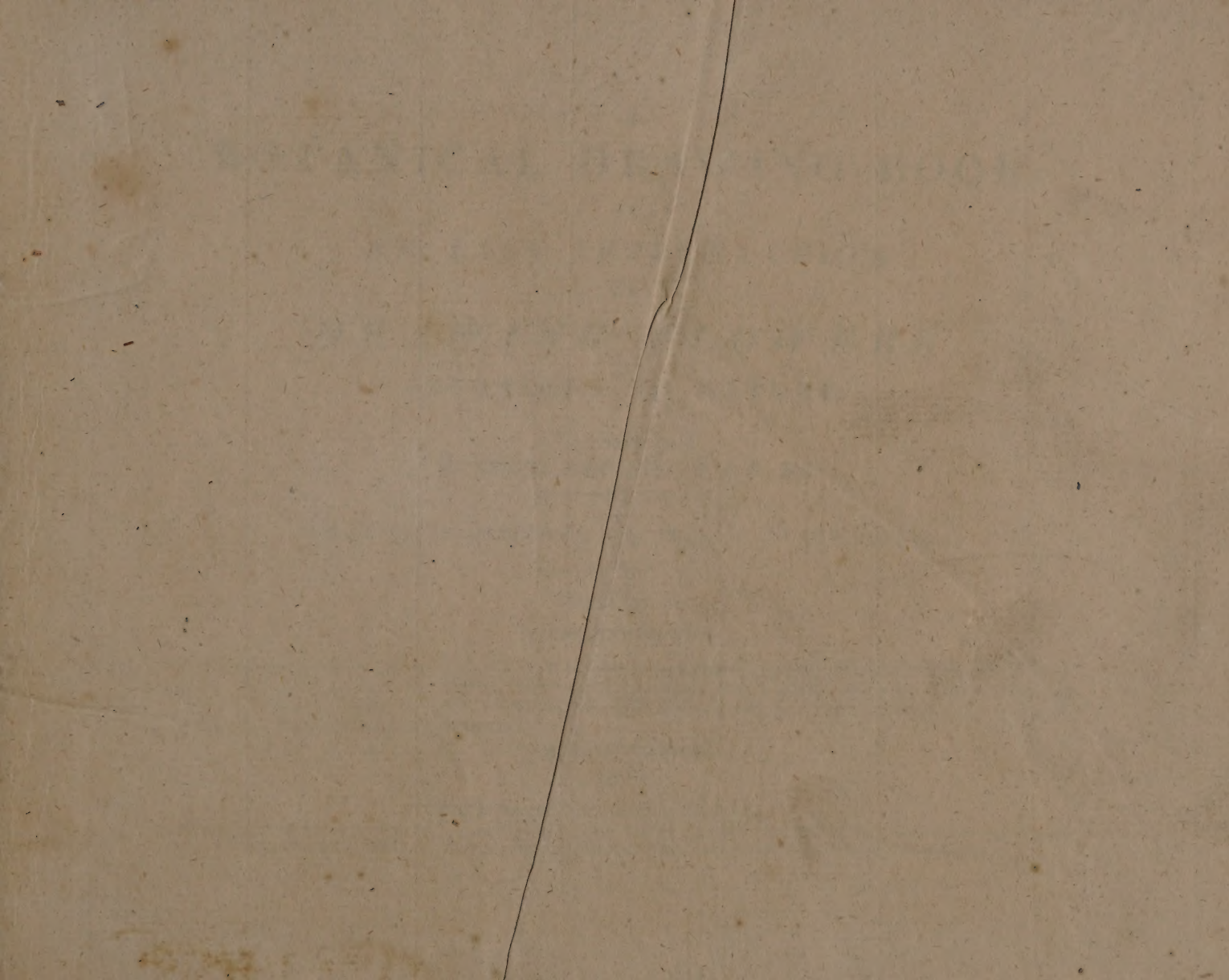


*Botanical
Drawing Book.*

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A
BOTANICAL DRAWING-BOOK:
 OR,
 AN EASY INTRODUCTION
 TO
DRAWING FLOWERS
 ACCORDING TO NATURE.

By *JAMES SOWERBY, F. L. S., &c.*

ORIGINALLY DESIGNED FOR THE USE OF HIS PUPILS.

SECOND EDITION.

The AUTHOR having experienced the Want of a DRAWING-BOOK sufficiently accurate to enable YOUNG BEGINNERS, who are fond of DELINEATING FLOWERS, to distinguish the different Parts absolutely necessary to characterize each PLANT, he has been induced to offer a few DESIGNS to the PUBLIC, in order to facilitate BOTANICAL STUDIES, and blend Amusement with Improvement.

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BOTANICAL DRAWING-BOOK, &c.

FLOWERS are defined by BOTANISTS to consist of Seven Parts. *First*, the Calyx. *Second*, Corolla, or Petal. *Third*, Stamen. *Fourth*, Pistil, or Pistillum. *Fifth*, Seed-vessel, or Pericarpium. *Sixth*, Seed. *Seventh*, Receptacle. To which may be added the Nectary, which generally secretes the Honey.

PLATE I.

We begin with the *Third* Division, or Stamen, because most simple and easy for Learners to imitate.— This is generally composed of Three Parts, viz. The *Filament*, or *Thread*, which sustains the *Anther*; in which is contained a fine Dust, the *Pollen*, or *Farina*. These are called the *Male* Parts of a Flower; and on them are founded the *Classes* of Plants.

Fig. 1. A Filament. (a) the Anther detached from it.

2. A double Anther (which is most common) joining the Filament.

3. The Anther opening, showing the Pollen. This is an Example of all the Three Parts composing the Stamen.

4. Anther, pointed at the Top or Apex.

5. Filament, continuing above the Anther.

6. Showing a Contrast in the Stamen of different Flowers from the Proportion of the Filament and Anther.

Fig. 7. The Stamen, open at the Apex and emitting the Pollen.

8. Hairy Filament; as Plate VI.

9. Filament remarkably thick, as in the *Yucca*.

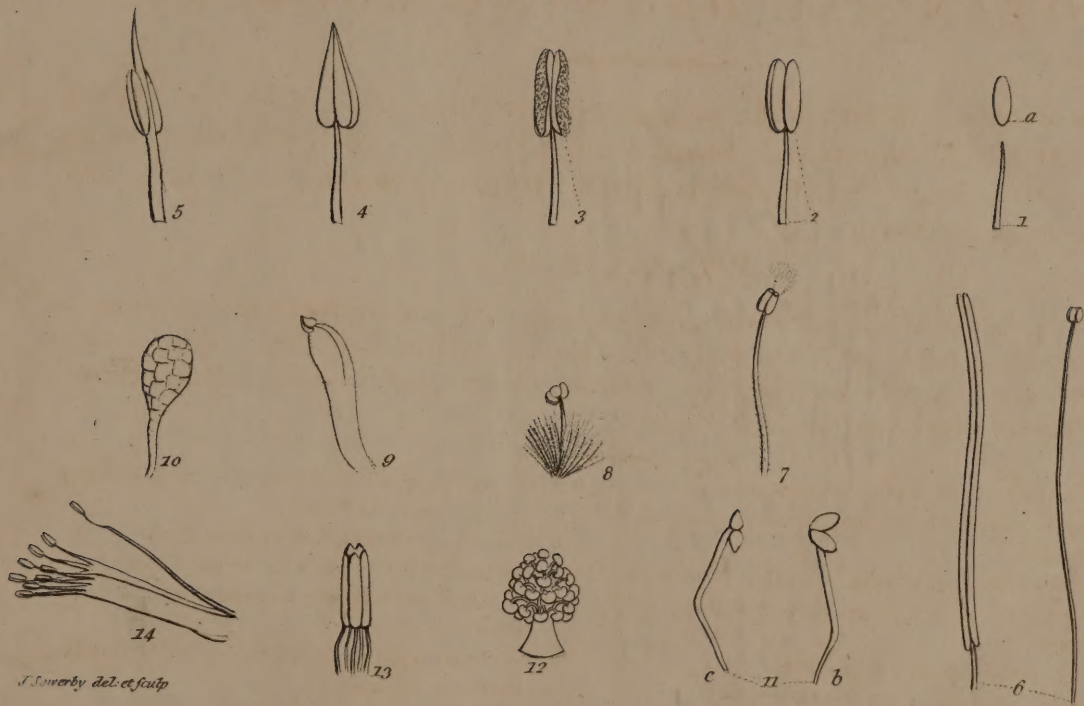
10. Club-formed Stamen, as in the *Orchis*. *Note*, This is magnified, and resembles an Anther or Collection of Pollen.

11. Two Stamens of the *Fox-Glove*; (b) before shedding the Pollen, (c) after.

12. Many Anthers attached to one Base.

13. Anthers united.

14. Stamens in Two Divisions.



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P L A T E II.

WE proceed with the *Fourth* Division, or *Pistillum*, being also easy.—It is composed of Three Parts, viz. The *Stigma*, which is the Apex, or Extremity; the *Style*, or the Middle; and the *Germen*, *future Seed-vessel*, or *Pericarpium*, generally the Base. These are considered as the *Female* Parts of the Flower, on which the *Orders* of Plants are chiefly founded.

- | | |
|--|---|
| <p>Fig. 1. A plain Pistil: (a) pointed Stigma, (b) the Style, (c) the Germen.</p> <p>2. The Three Parts more distinct, as in <i>Cowslip</i>, <i>Primrose*</i>, &c.</p> <p>3. The Stigma divided in Two, or bifid, as in <i>Forget-me-not</i>, &c.</p> <p>4. Divided in Three Parts, or trifid, as the <i>Lily</i>, &c.</p> <p>5. Divided in Four, as in <i>Epilobium</i>, &c. In some Plants the Stigma hangs down.</p> <p>6. Divided in Five, and knobbed.</p> <p>7. The Stigma fixed like a Button on the Style.</p> <p>8. A Stigma with nearly two Knobs.</p> | <p>Fig. 9. Trifid Stigma, each of which is divided, as in <i>Saffron</i>, &c.</p> <p>10. Pistil of a <i>Tulip</i>, Three-sided, with a large trifid Stigma, and very short Style.</p> <p>11. Pistil, of the <i>Poppy</i>, or <i>Papaver</i>, Style concealed.</p> <p>12. Pistil of an <i>Iris</i>, with (d) the Stigma commonly taken for Corolla; (e) the Base of the Style, where the Petals were taken off; (f) the Germen, or Pericarpium.</p> <p>13. The Stigma, Style, and Germen of an <i>Epilobium</i>; (g) the Top of the Pericarpium, where the Calyx and Petals were taken from.</p> |
|--|---|

* If the Pupil would examine the *Primrose*, (for Example,) he would discover the Stigma in the Centre, and Five very small Anthers connected by their short Filaments within the Tube of the Flower.



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P L A T E III.

COROLLA, or PETALS—Second Division

A PETAL is divided into Two Parts; the spreading Part or Lamina, and the narrow Base, Claw, or *Unguis*: When tubular, the spreading Part is called the Limbus.

Fig. 1. A Petal, nearly round, or orbicular.

2. Oblong, as in many Flowers.

3. Heart-shaped, or Cordate, with the Point downwards, as *Roses*, &c.

4. Nearly Triangular, as *Mallow*, &c.

5. Twisted, as in the *Dog's-tooth Violet*, &c.

6. The Four Petals of a Butterfly-like, or Papilionaceous, Corolla. (a) the upright Petal, Standard, or Vexillum; (b) the Wings, Side Petals, or Alæ; (c) the keeled, lower Petal, or Carina*.

Fig. 7. The Unguis and Lamina distinct, as in the *Stock* or *Wall Flower*. (d) The Unguis; (e) the Lamina.

8. The same in the *Pink*, or *Dianthus*; the Lamina notched, or serrated.

9 Two Petals of a Compound Flower. (f) the Centre; (g) the Radius †.

10. Two other Florets often compounded in a similar Manner.

11. A Petal split, or cloven, as in *Chickweed*.

* Connected at the Base in an acute Angle, something resembling the Keel of a Boat.

† Compound Flowers have sometimes but one Sort of Floret, as *Dandelion*; sometimes two, as *Daisy*, &c. which I hope the Pupil will examine.



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PLATE IV.

The CALYX, or First Division,

WHICH is of One, Two, Three, or more Parts, and various in its Form, Colour, &c. This is said to be a Continuation of the Epidermis, or outer Bark.

- Fig. 1. A One-leafed or Monophyllous Calyx; this is a Sheath, or Spatha, as in *Narcissus*, &c.
2. Monophyllous, with Five Divisions at the Top, or Apex.
3. Calyx of a Grass, in Two Parts, or Diphyllous.
4. Ditto, with Three Parts or Segments, or Triphyllous, as Plate VI.
5. Ditto, divided into Four Parts, as Herb *Paris*, &c.
6. Ditto, divided into many Segments.
7. Ditto, with Two Lips, or Bilabiate. Some Calyces show this much more distinctly.
8. Ditto, with Five Segments turned back or upwards, the other Five inwards or downwards, as in many Plants.
9. Calyx double, as in *Dandelion*.
10. A Receptacle, or Receptaculum, of the *Dandelion*. This belongs to the Seventh Division, and is the End of the Foot-stalk, or Pedunculus*, connecting and supporting the other Parts of Fructification. Sometimes very different.

* Pedunculus, the Foot-stalk of the Flower or Fruit. When coming from the Root, as in *Narcissus*, Fig. 1, it is a Scapus; also, in the *Dandelion*, Fig. 9. This is cut, to show it is hollow, (it is also milky or lactescent); the other Examples have part of their proper Peduncles.



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PLATE V.

SPECIMENS of various FLOWERS, &c.

- Fig. 1. A Bell-shaped or Campanulate Corolla; this being but a single Petal, is called Monopetalous: (*a*) the Calyx, (*b*) the Peduncle. *Note*, Most of the Flowers here represented have their Calyces and Peduncles.
2. A Monopetalous and Salver-formed Corolla, called Hypocrateriform; example, *Water Violet*, *Primrose*, &c.
3. A Wheel-formed or Rotate Corolla; example, *Veronica*.
4. A Cross-formed or Cruciform Corolla; example, *Wall-Flower*, or *Single Stock*.
5. A Grinning or Ringent Corolla, called also Personate, as *Snap Dragon*, which has a long and pointed Base

at *n*, called the Nectary; this differs exceedingly in Form, &c. in different Flowers: that Part of a Corolla which cannot be comprised under any of the Seven Terms or Appellations, is commonly considered as Nectary; in the present Case, it is evidently an Elongation of the Corolla.

- Fig. 6. A Monopetalous Corolla with Eight Segments, as in *Chlora*. This is not so well seen till examined.
7. Corolla of Grass, with the Three Stamina; the Two feathered Styles, &c. (*b*) its Calyx.
8. A Butterfly or Papilionaceous Corolla; the different Petals explained in Plate III. Fig. 6.

SEEDS, very various in FORM, COLOUR, &c.

- Fig. 9. Three Seeds, or Semina; one round, or spherical, as *a*; one Kidney, or Reniform, *b*; one triangular, *c*:— They have sometimes a Crown, or Corona; or are winged with a Down, or Pappus, forming Star-like Rays if viewed at the Top or Apex, as Fig. 10.— Without a Foot-stalk, or Sessile, being immediately attached to the Seed, as Fig. 11.
12. Standing on a Foot-stalk or Stipes.
13. Each Ray is feathered. This is often a useful distinction.
A Seed is divided into different Parts.

- Fig. 14. A Broad Bean, in which the Eye or Hilum *f* is very visible; and the protuberating Part *g* is caused by the Root or Radicula. The Heart and Essence of the Seed, viz. the Corculum, with the Plumula, or future Plant, will be seen in dividing this Seed; and the Learner will do well to examine Nature at all Opportunities.
15. A Seed-vessel with Five Cells (cannot be easily mistaken): Seed-vessels vary much, as is well known. (I have here represented an Apple*, Pomum, or pulpy Pericarpium.)

* This is called the Cherry Apple in the *Pomona Britannica*, from its external Resemblance to that Fruit.



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P L A T E VI.

TRADESCANTIA VIRGINICA, or *VIRGINIAN SPIDER-WORT*.

THE Parts contained in this Flower, no doubt, will easily be understood by those who have become Masters of the preceding; we therefore explain the Remainder for their Satisfaction :

Each Flower is supported by its proper Peduncle, or Flower-stem; in this Plant many arise from the same common Centre, forming a simple Umbel; the Two Leaves form a kind of Involucrum, or partial Calyx; the Stem, or Caulis, so called when it supports the Fructification and Leaves, is cut obliquely from the rest of the Plant, which shows it to be rather pithy.

It may be necessary to inform those who wish to enter into this pleasing SCIENCE, that very much depends on the Parts, Situation, and Structure of the Flower*, that it is highly necessary they should examine their various Forms: by so doing, with the Assistance of this Book, I presume they may attain to Perfection in this Part of Drawing.

✍ This WORK being intended to convey to those, inclined to retain, by delineating, the Form of Subjects in NATURAL HISTORY, particularly in BOTANY; we have made use of Outlines, as more easy and distinct, for good Outlines are the first grand Principle of all Drawing.

* For an accurate and complete Illustration of the Science of Botany, see Dr. Smith's Introduction, just publishing by Longman and Co.



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P L A T E VII.

SOME Plants, often large Trees, have Flowers of one sort on one part of the branch, and of another sort on another part of the branch, or the Male Flowers separate from the Female ones: thus the *Cedar of Lebanon*, one extent of Solomon's Botanical Wisdom, is of this nature. Fig. 1, The Male Flower. Fig. 2, The Female Flowers, which become large cones when ripe. Sometimes the different Sexes are on different Plants. Other Plants are often of admirable structure, although they have no parts that may come under the general denomination or appearance of Flowers. So the *Filices* or *Ferns* produce almost invisible seeds in little seed-vessels or capsules, generally on the back of the Frons* :— See *Eng. Bot.* 1458, 1459, 1460, 1461, &c.

The MUSCI, or MOSSES,

However common, seem only to attract notice from their soft and delicate appearance; but when botanically examined their structure is truly interesting, the capsule being formed like a case with a cover. Fig. 3, *Funaria hygrometrica* †. Fig. 4, Magnified Capsule. Fig. 5, Calyptra, or Outer Covering of the Capsule. The little Moss, Fig. 6, seldom found in Great Britain, is supposed by Hasselquist to be the Hyssop of Solomon, (or the other extent of his Botanical Wisdom or Knowledge) because he found it on the walls of Jerusalem;—see *Eng. Bot.* 1245. Fig. 7. is *Splachnum ampullaceum*. Fig. 8, The Capsule magnified, showing teeth, commonly called by Botanists the *Peristomium*.

* Frons is the same as foliage in the meaning, but chiefly used for such plants, however, as have all foliage with very little or no main stem, especially those that have seed on the leaf.

† Commonly found on damp waste new ground, or bricks, banksides, &c., and has its name from its curving and twisting in dry weather, and being straighter in wet weather.

Plate 7

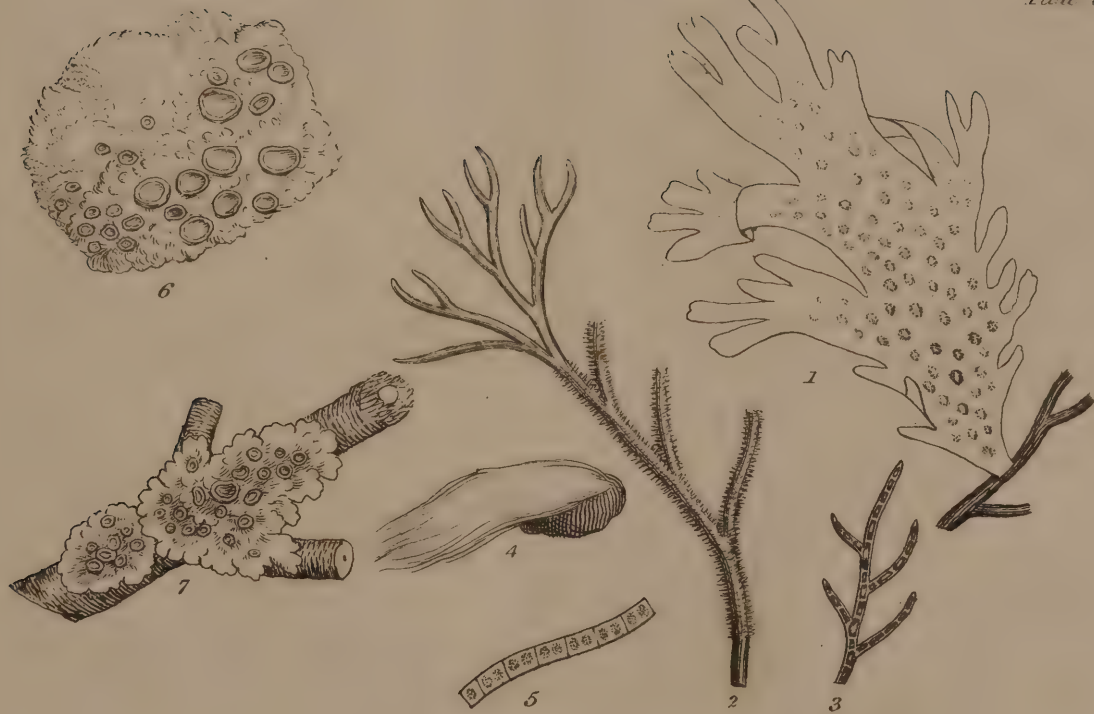


P L A T E VIII.

ALGÆ.

SEA WEEDS (commonly so called) are of this tribe, and are divided by Botanists into *Fucus*, *Ulva*, and *Conferva*, &c.

Fig. 1, *Fucus punctatus*, or Dotted Fucus, has the fruit or seeds on the outside of the Substance. Fig. 2, A *Conferva* growing on a *Fucus*, which are mostly divided in partitions, as Fig. 3, but are extremely minute. Fig. 4, *Conferva bipunctata*, natural size. Fig. 5, A magnified piece. Other *Algæ* are found on trunks of trees, stones, &c., and are, by botanists, termed *Lichens*, which, although at first they often appear insignificant, yet they are beautiful and truly interesting upon careful examination.—Some are of great importance in assisting the most beautiful scarlet dyes, and lord Dundonald has found them essential in affording a gum for dyers. Fig. 6, *Lichen tartareus*. Fig. 7, *Lichen parietinus*, common on old bushes, walls, &c.



P L A T E IX.

FUNGI, or MUSHROOMS.

THESE, by the vulgar, are commonly called Toadstools, or Toadscaps, &c. (if not *Mushrooms*, or known to be esculent.) There are a great many species, above five hundred*, and some are remarkably curious in their structure. They chiefly consist of five principal parts. First—Lamellæ or Gills, *a*. Second—Cap, Top, or Pileus, *b*. Third—Stem or Stipes, *c*. Fourth—Annulus or Ruffle, *d*. Fifth—Volva or First Covering, *e*.†

Those Fungi with Gills or Lamellæ are called *Agaricus* by Linnæus. So the true Edible Mushroom is an *Agaricus*, and is called *A. campestris*, because chiefly found in open ground, Fig. 1. Fig. 2. is called *A. muscarius*,—a beautiful, but poisonous, Agaric. *e* is the Volva or Wrapper, which once enveloped the whole Fungus; and the spots on the Pileus, although so very orderly placed, are fragments of it. This is found chiefly in Pine-woods. We add some other vegetables which are called Fungi. Thus there are Fungi formed somewhat cup-like, called Pezizas. Fig. 3. *Peziza cochleata*, from its curling or involution somewhat on one side. Others are called Lycoperdons, and when dry, Puff Balls, because they hold an extremely fine powder, which passes from them analogous to a barber's puff. The Lycoperdons are sometimes simple skins including the powder. At others they are supported by legs, as it were. Fig. 4. The Volva, having divided into four segments when protruding the ball, and the lining, as it were, extending from it, and supporting the ball on the centre: this is constant in the species. Some Fungi are called *Clavaria*, because they are in the shape of clubs. Fig. 5. *Clavaria Herculeana*, being like Hercules's club.

Great Britain is favoured with many varieties of these latter classes; and I thought I could not do better than to use some of them for examples, that those who were inclined might often be able to see growing subjects.

* Most of which are figured in English Fungi.

† This covers the pileus when young, and as the Fungus advances in growth becomes divided, and forms the white spots.





P L A T E X.

BEFORE I could take my leave of this subject, I could not help adding a short lesson on the use of Opaque Colours, commonly called Body-colours, which are much inquired after, as they generally give additional force or finishing to any subject well managed, and may be carried to admirable nicety by the persevering artist.

The little coloured print before us is calculated to show most of the colours necessary for use on this head, and the foregoing plates will show the remainder. Thus there will be a concise list of colours for every purpose, among what are called water-colours.

White, or light, is expressed in the heightening the petal of the Primrose, and gradually passes to pale or light yellow, and the five blots are of a fuller yellow.

Red is in different gradations at the base of the midrib of the rugose* Primrose-leaf.

Blue is seen in some variety in the middle blue flowers of *Myosotis scorpioides*. Thus there are examples of the *three Primitive Colours*, from which all others proceed.

Yellow and *Red* compose one of the binaries, making *orange*, which is exemplified in the little glandular covers over the stamina in the middle of the corolla of the *Myosotis* above mentioned; and, although so small, show some gradations from light to dark.

The other binaries are

Yellow and *Blue*, which make the greens, and are pretty well understood; and

Red and *Blue* to form the purple tints, also pretty well known. These three may form all the seven prismatic colours and gradations.

The three incorporated, which may be called ternaries, make up the sum total of all tints possible, forming the *browns*, *grays*, and *blacks* †. Thus there are *primaries*, *binaries*, and *ternaries* ‡:—See Chromatic Scale.

* Smith's Introduction to Botany, p. 163.

† I know that Dr. Lewis pronounced that the three primitives would not produce a black.

‡ I was favoured with this by — Wilkins, Esq. Secretary at the India House.

It next depends upon the artist to place them judiciously for the intended representation, on which alone perfection depends: not unlike the statuary, who can find any form he has ability to produce in the rudest block of stone or marble.

I will now in order show all the pigments necessary for use.

Whites, whether considered as light or colour, are absolutely necessary for opaque drawings; but the white paper in some drawings may serve, as in *tab. 1. fig. 9. 10. 14. tab. 2. fig. 12.* or the colour more dilute for a lightish appearance, as is readily seen in different examples. A new magnesian white, found lately in India, is used in the lights of the Primrose*. It will not change, and is likely to prove very useful. 2. *The best Whitening*, when well managed, may be used in general. 3. *Bone-white* may sometimes be used, and is convenient with some purples; but changes brown with Prussian blue.

Yellows. 4. *Gamboge*, *tab. 1. part of tab. 5, 6, 7, 8. 13. &c.* and 5. *King's yellow*, sometimes used in opaque objects, may be all that are necessary.

Reds may be 6. *Carmine*, *tab. 1. fig. 4.* 7. *Red cochineal*, *tab. 3. fig. 6. a;* and 8. *Venetian red*, merely a common brick-red, and not worth further notice. And of

Blues. 9. *Prussian*, used in shading flowers, *tab. 10.* 10. *Indigo*, useful in fixing shades and dull greens, browns, &c. 11. *Antwerp*, *tab. 5. fig. 1. &c.* 12. *Smalt*; and 13. *Ultramarine* †.

Nos. 4. 6 and 9, if truly perfect and bright, would answer for the composition of all colours. The others are merely supernumeraries for cheapness or brightness; and Nature, ever willing to help us, has allowed us to make two more tints; viz. *Orange lead*, and *Verdigrise green*, which happily are seldom wanted; the first is apt to turn black, and the other is unwholesome to use much of.

I once thought of adding to this a Chromatic Scale, or List of Colours; but as that is calculated for more universal purposes, I shall publish it separate, that it may be attached to this or any other work, as may be most desirable.

* I was favoured with this by — Wilkins, Esq. Secretary at the India House.

† These two latter ones are seldom wanted, are very opaque, and require strong gum Arabic water in using them; the others a more moderate share, and seldom any thing else when well ground. Gamboge is a sort of gum, and wants no addition.

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* * * Mr. Sowerby has, in the above Works, endeavoured at filling up some of the desiderata of British information with the best intent. Their utility is sufficiently evinced by the publicity they have obtained without the usual aid of continual advertisement.

